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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No: 37637-0003

Re patent application of
Rainer HINTSCHE et al.

Group Art Unit: 1634

Serial No. 09/142,660

Examiner: B. Sisson

Filed: December 23, 1998

For: DETECTION OF MOLECULES AND MOLECULE COMPLEXES

Amendment under 37 CFR 1.111

Commissioner for Patents
Washington, DC 20231

Sir:

This communication, which accompanies the filing of request for Continued Patent Application, responds to the Advisory Action of January 15, 2002 and comments made in the Interview Summary mailed January 15, 2002 (Paper No. 35). Please debit any underpayments, or credit any overpayments, to firm Deposit Account No. 08-1641.

Please cancel claims 26, 35, 36, 41, and 58 without prejudice or disclaimer.

Please enter the following new claim:

62. (New) A method according to claim 47, wherein the noble metal is selected from the group consisting of gold, platinum and iridium.

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Please amend the claims to read, as follows:

21. (Amended) A method of detecting a molecule or molecule complex in a sample, comprising:

(a) contacting the molecule or molecular complex with an ultra-microelectrode array, said ultra-microelectrode array comprising at least two electrode

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structures, wherein each of said electrode structures is insulated from each other, and wherein the spacing between the electrode structures is less than 3 μm;

(b) producing an alternating electric field between the electrode structures; and

(c) measuring changes in current or potential between the electrode structures, whereby the changes in current or potential are caused by the molecule or the molecular complex wherein said molecule or molecular complex comprises a nucleic acid or antibody, and wherein the molecule or molecular complex is position in the gap between the electrode structure.

25. (Amended) A method according to claim 21, wherein the changes in current or potential are caused by diffusion or binding of the molecule or molecular complex to the ultra-microelectrode array.

31. (Amended) A method according to claim 21, wherein the molecule or molecular complex binds to a surface of the electrode structures.

32.(Amended) A method according to claim 31, wherein the molecule or molecular complex binds to the surface of the electrode structures via physical or chemical binding.

33. (Amended) A method according to claim 31, wherein the molecule or molecular complex binds to the surface of the electrode structures via self-assembling.

34. (Amended) A method according to claim 31, wherein the molecule or molecular complex binds to the surface of the electrode structures via electropolymerization.

37. (Amended) A method according to claim 21, wherein the electrode structures are layered with a substrate which is bound to an antigen or a nucleic acid molecule,

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said antigen or said nucleic acid molecule capable of binding to the molecule or molecular complex to be detected

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40. (Amended) A method according to claim 37, wherein the second molecule comprises an antigen, and wherein the molecule or molecular complex to be detected comprises an antibody.

61. (Amended) A method of detecting a molecule or molecule complex in a sample, comprising:

(a) contacting the molecule or molecule complex with an ultra-microelectrode array, said ultra-microelectrode array comprising at least two electrode structures, wherein each of said electrode structures is insulated from each other wherein the spacing between the electrode structures is less than 1 μm;

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(b) producing an alternating electric field between the electrode structures; and

(c) measuring changes in current or potential between the electrode structures, whereby the changes in current or potential are caused by the molecule or the molecular complex, wherein said molecule or molecular complex comprises a nucleic acid or antibody and wherein the molecule or molecular complex is positioned in the gap between the electrode structure.

REMARKS

Applicants thank Examiner Sisson for his consideration of the above claims and willingness to consider further amendments to be discussed during a personal interview to be conducted prior to issuance of an Office Action. Applicants herewith request such interview and will follow-up this request by telephone.

In the above amendment, various dependent claims have been amended to change "molecule complex" to "molecular complex." Independent claims 26 and 61 have been amended to further characterize the claimed invention. For instance, the independent claims now specify that each of the electrode structures is insulated from each other. Support for this phrase can be found, *e.g.*, at page 5, lines 15-16. The independent claims also note that molecule or molecular complex comprises a nucleic acid or antibody, which is found, *e.g.*, at page 10, line 8 and page 11, lines 2-12. Also, support for the feature, "the molecule or molecular complex is positioned in the gap between the electrode structure" exists, *inter alia*, at page 3, lines 13-16. In this regard, the spacing of the electrodes are less than 3 μm and can be arranged so closely next to one another that they approach the size of large molecular complexes, *e.g.*, immunoproteins or DNA molecules. *See id.* In addition, support for the term, "sample," can be found at page 6, line 1.

Further support for independent claims 26 and 61 can be found at page 3, line 27 through page 4, line 2. In this regard, the electrodes may or may not be coated with a member that can bind the molecule or molecular complex.

Claims 26, 35, 36, 41, and 58 have been canceled without prejudice or disclaimer. Of course, Applicants reserve the right to pursue such subject matter in divisional or continuation applications. Thus, with the entry of this amendment, claims 21-25, 27-34, 37-40, 42-55 and 59-62 will be active in this case.

Respectfully submitted,

May 20, 2002
Date

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